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Gastric Digestion.

An extract we reprint this week from *The British Medical Journal* is of unusual iterest. It consists of a summary by Professor Thompson, of Belfast, of work done by a Russian physiologist—work which apparently answers a number of questions of the greatest practical interest to feeders of stock as well as to medical men.

Although we trust our readers will go carefully through the whole article we offer a short epitome of the chief results.

(1) That gastric secretion is proportionate to the amount of food masticated.

(2) That the gastric juice is secreted in greatest quantity during the early period of digestion, but continues to be discharged in declining quantity as long as any food remains to be dealt with.

(3) That the earlier secretion possesses the greatest digestive power.

(4) That the digestive power of gastric juice is in proportion to the nitrogenous ratio of the food ingested.

(5) That the gastric secretion varies according to the kind of food taken, and that the gastric glands have the power of gradual adaptation to the requirements of digestion.

(6) That the action of the gastric glands is dependent less upon the arrival of food in the stomach than upon the action of chewing and swallowing.

(7) That the odour, taste, and other appetising conditions of food all affect the digestion in the stomach.

(8) That the whole digestive process is a series of actions linked together, and controlled by nervous influences, each dependent upon the other and all affected by habit.

One practical lesson is, that all great and sudden changes of dietary are wrong, and that the nutritive ratio of food should only be altered gradually. Everyone has noticed for himself how a change of diet for a day or two is likely to upset digestion. What must be the effect of removing a horse, or other animal, from one country to another where each kind of provender is different from that to which he has been accustomed? This article seems to us to suggest many important matters which apply to the health and condition of stock, and to afford a key to some problems which have hitherto puzzled us for an answer, but which have been recognised as facts by the practical man.

ANEURISM OF THE ANTERIOR MESENTERIC ARTERY WITH RUPTURE.

Subject.—An aged brewery horse.

Clinical History.—Previously healthy. On the previous day the animal appeared dull and off his feed, next morning he commenced to have some difficulty in breathing, and wandered in a listless manner about the stall, pulse very weak, extremities cold, visible mucous membrane pallid, temperature normal, eyes staring and pupils widely dilated; he showed a tendency to force his head against any solid object. He died suddenly in about an hour after my attendance.

Post-mortem.—A large amount of blood in the abdominal cavity. The anterior mesenteric artery was enormously dilated and showed large aneurisms along its course, in one of these a large rupture was apparent. Careful examination did not detect any trace of parasites.

Remarks.—I made an erroneous diagnosis in this case, as I imagined it was one of rupture of a cerebral blood-vessel. It is surprising that no symptoms of the serious condition that existed were apparent before the day of the animal's decease. But we learn from autopsies far more than from observation of the living—the ideal study is to combine both.

CARDIAC THROMBUS.

Subject.—A collie dog, three years old. Had been treated by me on several occasions for eczema; it was very difficult to get the animal into condition.

Clinical History.—When brought to the Infirmary the dog was reported to be off his feed, and to be constantly passing urine, and looking towards his flanks. On the slightest exertion he appeared very distressed and panted excessively, there was marked palpitation of the heart.

The following symptoms were observed during the eight days he was under my care. Greatly accelerated respirations, pulse irregular and quick, gradual weakness in the hind extremities and a staggering gait, no appetite for solid food, but drank freely of milk; his constitution ran down rapidly and he was reduced to a mere skeleton.

During the last few days a loud pulsation could be both heard and felt all through the body, and as he was in great distress I destroyed him with chloroform.

Post-mortem.—The heart was enlarged and slightly affected with fatty degeneration. The right side contained a large organised ante-mortem clot, greyish white in colour, firm in consistence, and entangled in the auriculo ventricular valves.

Remarks.—It is difficult to account for some of the symptoms presented in this case. We cannot account for the occurrence of the thrombus, and no lesions were apparent in other organs. The loud beat of the heart and the impulse diffused through the body was very well marked.

E. Wallis Hoare, F.R.C.V.S., Cork.

HEREDITARY CHOREA.

Some months ago I was called to see a bull bitch suffering from chorea affecting the head, this was so slight that my client did not notice it at the time of purchase. She was bought for breeding purposes and I was asked would the puppies likely be affected, I thought not. As it turned out I was wrong. The bitch had four puppies, three were healthy but the fourth from its birth was badly affected in three legs and the head, quite a cripple.

The bitch was put to a different dog and had five puppies, three were destroyed having malformed lower jaws, the remaining two were suffering from chorea affecting the heads and hind quarters. The bitch was supposed never to have had distemper, neither had the puppies. Is this common?

Ernest Morgan.

South House, Faversham,

FRACTURED HUMERI.

Chestnut cob, aged 5 years, belonging to J. G., just sold to a doctor.

After coming into yard from his trial drive, the groom gave him a clap on the rump. stating to a few admirers that "that was the right sort" The cob being nervous gave a sudden start and threw the near fore foot right up to his nose and hopped round the yard on three legs. Humerus broken right through the shank.

Case 2.—Brown van gelding, 6 years, belonging to C. Co., driven in double harness.

While going at a slow jog trot—possibly hit with the whip—suddenly threw up his near fore leg and stopped. Walked to the stable on three legs, occasionally toeing ground with fourth. No crepitation. Animal placed in slings; next day shifted in slings; crepitation over humerus clear.

Post-Mortem Examination.—Oblique fracture of humerus.

HEART DISEASE.

Brown cart gelding, aged, propertyof J. W.

Took to falling in cart. Afterwards got useless, owing to falling right over when moved at all. When taken out of stable he would walk for about 20 yards all right: suddenly he would stop, put back his ears, stiffen his body, weigh himself backwards and fall a broadsider, as stiff as the pinchers. His limbs and eyes then worked for about a couple of minutes; consciousness would return, and up he would get. If asked to move again he would repeat the same as long as you liked. He fed well and had a fair but weak pulse.

Post-mortem Examination.—Water between the skin and abdominal muscles; liver schirrous, right lung water-logged, and a little fluid in the pleuræ and peritoneal cavaties. The heart was unique. When taken out it collapsed as flat as an empty stomach. It was of enormous dimensions, and the walls (even of the left side) not much thicker than strong paper, the auricles stood up from the heart like gigantic caps, but no other disease was present. The brain was sound.

J. Gregg.

Belfast.

ABSTRACTS FROM FOREIGN JOURNALS.

The Castration of Cows and other Domesticated Animals.—Paper read by Veterinary Surgeon Liebener before an assembly of Veterinary Surgeons from the Province of Saxony.

I had only intended to make some remarks about the spaying of cows, but at the wish of my confrères I will also make some limited remarks on the spaying of the other domesticated animals.

The operation of spaying cattle is an old one. It has been known since the beginning of the 18th century. Disease may affect the ovaries, the fallopian tubes, the uterus, the vagina, and the vulva. The anatomical relations of these organs I presume you know.

In castration the ovaries must be removed from the peritoneal cavity. This can be done in different ways, viz., through the flank, through the vagina, through the linea alba, and through the rectum. The operation through the flank can be performed in all the domesticated animals, that through the vagina and rectum only in large animals and that through the linea alba only in small animals.

Castration of cattle is undertaken with the object of increasing their weight and lengthening the milk giving period.

In former times the operation was conducted almost entirely through the flank. Many animals died then. Charlier introduced castration through the vagina. Since his time this operation has been the one most in favour with veterinary surgeons.

By Charlier's method the dangers of spaying are reduced to a minimum. The results achieved by his method are well worth the consideration of all stock-owners. In Charlier's experience the milk yield in castrated cattle was 3200 litres—about 711 gallons annually; whilst the same number of non-castrated cows only yielded 1700 litres—about 379 gallons—the increase in fat and flesh of the castrated animals was also large. Of 264 cattle operated on eight died but this loss was overbalanced by the gain in milk and body weight.

This loss was considered by many too great and the operation fell into desuetude. Since the aseptic treatment of wounds came into force the outlook for spaying has become much more favourable, and Ostertag asks with justice whether by means of antiseptic and disinfection precautions it is not possible to entirely do away with the loss from ovariotomy in animals so little susceptible to wound infection as cattle. If this question can be answered in the affirmative a

new prospect opens out for the castration of cows.

The operation through the vagina is undoubtedly the best one because the thorough carrying out of asepsis is easily possible. The chief difficulty in the carrying out of asepsis in our animals arises chiefly from the fact that it is impossible to apply a good enveloping antiseptic bandage. This difficulty has not to be met in the Charlier method because the surface of the wound inflicted is separated from the outside world by the long vagina and any great soiling under ordinary conditions cannot occur. The operator must not fail to disinfect the field of operation, his arm and instruments if he hopes to attain success.

Ostertag castrated 12 cows in a dairy in Berlin. Two feeding times before the operation the animals received no food and the evening previous to the operation a glycerine clyster in order to empty the rectum. Before the operation the vulva and its neighbourhood and the under surface of the tail were washed with soap and water and rinsed with 3 per cent. of creolin water. The instruments were thoroughly disinfected and the operator and his assistant who handed him the instruments disinfected their hands and arms carefully after cleansing them with a brush and soap and water. The vagina is disinfected with irrigations and all parts of the same can be similarly moistened with the hand. All manipulations in the vagina and peritoneal cavity are conducted with the right hand and arm and these are repeatedly disinfected when removed. After removal of the ovaries the vagina is again irrigated and all traces of blood removed.

Ostertag does not cut right through the vagina, but only through the mucous and a great part of the muscular coat, the rest of the latter and the serosa is ruptured with a quick thrust with the finger. This latter precaution is very advisable because the rectum lies immediately in front of the vaginal vault and hangs deep in the pelvic cavity and may be easily injured with the knife. It is advisable, too, to make the opening in the vagina large enough to admit the whole hand.

The instruments used are a bistouri caché, the vaginal stretcher of Harms, as well as Colins' castration forceps No. 2481 and 89 of Hauptner's new catalogue.

The cow to be operated on is held by some attendants and usually stands quiet enough. One makes the opening in the vagina in the above described manner, seeks for the ovaries, fixes the womb with the right hand and presses the ovaries with the left hand into the jaws of the forceps and by a few quick turns they are removed.

The operation lasts about 15 minutes; after treatment is not necessary. In a favourable course the cows stand with arched back for a short time and have little appetite, and the supply of milk falls away some pints.

Ostertag's 12 operations ended well, and if in some of the animals the milk supply was not favourably influenced yet the animals were fattened much more easily on account of not troubling about the bull, and for this reason castration is undertaken.

I castrated two cows as described above and had them slaughtered the same day. The operation was successfully performed, but in each case there was a clot of blood as big as one's fist in the operation wound.

Between October and January I operated on five cows which had calved five or six weekly previously. On a sixth cow I did not finish the operation, as I cut into the rectum. Bad result did not take place in this animal.

The remaining five ate somewhat sparingly at first, in four of them the slight loss of milk supply and arching of the back soon disappeared. The fifth cow ate nothing next day, had a temperature of over 41 C. and was slaughtered on the 4th day. On account of severe peritonitis the flesh was useless for the food of man.

Of the other four cattle, several weeks after, one had to have the rumen punctured for tympanitis; the other three did not have a daily increase in milk supply for some time, but to-day, after the space of a year, each cow gives about two gallons to two gallons and a quarter of milk. This favourable result is in every case attributable to castration. Strict measurings and weighings, in spite of my entreaties, were not carried out. The owner has repeatedly represented to me that the usefulness of the operation does not approximate the injury arising from the loss of a cow.

In every case I advise not to press the operation, but if one conducts it the owner ought to be made fully accquainted with the risk attending it, for experience teaches that any loss, which may easily arise, will be laid at our door.

Reference was then made to the spaying of mares, sows, and bitches, and Veterinary Surgeon Liebener closed his address and was thanked by the assembly.

G. M.

(To be continued).

VETERINARY SOCIETIES

MIDLAND COUNTIES VETERINARY MEDICAL ASSOCIATION.

THE GENERAL EDUCATION OF THE VETERINARY STUDENT.

By Prof. J. M'FADYEAN, R. V. Coll.

Discussion and Reply.

Mr. FRASER opened the discussion at the President's request. He said although he was prepared with an answer to Prof. M'Fadyean, he would rather, as a visitor, have spoken at a later period. He had had the honour of representing the profession upon the Council of the College for ten years, and while he did not say he had made no mistake he was not ashamed of any action he had taken or of any policy he had supported. He was one of the nine who supported the raising of the standard of examination in England, making it equivalent to that of Scotland, and he hoped it was an act of mere justice which the Council would one day see carried out. If he had not known what had taken place, and what was taking place in the veterinary profession, he should have thought, after hearing the very skilful paper that had just been read, that the preliminary examination was

something enormously difficult, requiring a University student or some highly accomplished man to pass it. They were no doubt acquainted with the College Register, and were familiar with the first schedule. A member of the Council, whose opinion he valued very highly, said at the last debate that an ordinary fifth standard school board boy could pass that examination. He (the speaker) believed that to be an exaggerated statement, and said so at the time, but except for one or two technical subjects, he would make another statement which might sound an exaggeration but which he believed to be true, and that was that any ordinary boy of 13 or 14 years of age could pass that examination without the slightest difficulty. He himself had a son, 13 years of age, who, as they could imagine, coming from such a parent, was only ordinarily gifted—(laughter)—and who could pass it. And yet Prof. M'Fadyean wished it to be believed that it was such a stiff affair that a young man of 17 could not pass it except with a struggle. It would be difficult to find young men of 17 or 18 in any ordinary school who could not pass a much higher examination. He would like to ask a preliminary question, and that was, Why have an educational examination at all?

Prof. M'FADYEAN: I have already answered that.

Mr. FRASER said he did not understand him to have done so. Why did they not have what they regarded as free trade in commerce, agriculture, literature, and the higher arts? Why did the veterinary profession surround itself with a ringed fence and require all candidates to jump it before they could be admitted to membership? They all knew their fathers must have had some excellent reason for the step they took in that direction. What was that reason? Two or three reasons had been alleged in his hearing, to some of which he attached weight and to others not. At the last meeting in Red Lion Square the very gentleman to whom he had referred said that if we were to expect veterinary surgeons of the future to associate with educated gentlemen we must expect them to be educated as gentlemen were. In other words, if they as a profession were to rise in the social scale they must be more liberally educated than they were at present. He (the speaker) attached no weight to that argument, for the simplest of all reasons, that if a man wished to rise in the social scale he must rise by force of the weight of his purse. Given sufficient money, a man could go into any society he liked. (Dissent). He did not expect them all to agree with him, but let them look round and see for themselves. Take a millionaire butcher from Chicago, and he was admitted into any society. But let him revert to the argument of Prof. Edgar, that a gentleman to mix with gentlemen must himself be educated as a gentleman. First of all, what constituted a gentleman? Instead of giving them his own definition he would quote the words of John Henry Newman whom, as a Midland man himself, they would probably believe. He (Newman) said that a gentleman was a man who never gave unnecessary pain. Now if they were prepared to accept the Cardinal's definition of a gentleman they would see that a man might be educated and not be a gentleman, just as a man might be a gentleman without being educated. Therefore the social argument had no force whatever. Take another reason, alleged in his hearing, to which he did attach some weight. It was said that unless a man was reasonably educated he would not be able to grasp all the subjects brought to his notice at the veterinary schools and so be unable to pass those final examinations which would enable him to practice his profession. Perhaps that was so, and unless a man had a fairly cultured intellect he was not capable of appreciating the lectures delivered at College, or recognising the value of what he saw and heard. On that point there could be no higher authority than Prof. M'Fadyean himself. But there was a third reason, and he attached more weight to it still, namely, that if they raised the standard of their examinations they were far more likely to draw their students from a more cultured section of the community and so acquire a higher social rank as a profession. Still, however, he had a separate reason of his own for raising the educational standard which he now put forward, and to his mind it was the only reason which would justify him supporting the raising of the standard. Very wisely they had been told by the essayist that the veterinary profession had only one object in view—to be of service to the community. He (the speaker) agreed with that, and if they had educated men such service could be rendered better than if they had illiterate men. Take the young man of to-day who, after passing the examinations at the veterinary schools, went away from 10, Red Lion Square with a piece of parchment under his arm called his diploma. That young man began to do what? To make a living; because that was what nine out of ten of them did. But surely it was unworthy of any man who entertained anything like a right view of his aim in life to do nothing but make a living. It was like sinking to the level of the lower creatures. "Yes," they would say, "he is going to serve the community by preventing the spread of disease among domesticated animals, and by restoring such as are diseased to health and strength." That was all very well, but his (the speaker's) contention was that that man was only just beginning his education, or, if they would prefer it, continuing the education he had already begun. The question might arise, "What do you mean by education?" And here again he would not venture to define the term himself. This time he would give them the definition of Thomas Arnold, another Midland man, by the way, who described an educated man as "one whose body, mind, and heart were cultivated to the limit of their capacity." Let the young veterinary surgeon bear that in mind and he would at once see that he had entered the profession, as indeed he might have entered any other profession, for the sole purpose of continuing his education. The facts of making a living and serving the community were only accidents of the situation. The higher aims of life could be accomplished, and he was pleased to be able to add were being accomplished by members of the profession now. It had been said to him in private, stated in the Council, and repeated in the paper that afternoon that the expenses of a higher education would be so great that the veterinary profession would not be worth it.

Prof. M'FADYEAN: No, no.

Mr. FRASER: And yet you say members have decreased since we raised the standard in 1892, and that if we raise it further, there is sure to be an increased diminution.

Prof. M'FADYEAN: Quite right.

Mr. FRASER, continuing, said it was not proposed to add to the curriculum but merely to raise the standard of education. What did that mean in £ s. d.? He had tried to work it out, and taking an ordinary fifth standard school boy he estimated that it would cost another £25 or £30 to enable him to accomplish what was required. That was the weight of "the enormous difficulty of expense" that would be incurred by raising the standard of examination. He was quite satisfied that Prof. M'Fadyean misinterpreted the figures he had given them in his paper. The Professor had shown them that the number of students was reduced and thought it might be due to the increased curriculum and the increased educational standard. He (the speaker) did not believe that. He believed it was due to the fact that the English nation was enjoying unusual commercial prosperity. The result of good trade was that young men wishing to share in this prosperity preferred commercial to professional careers, so as to qualify the more rapidly for a rise in the social scale.

Mr. GOOCH said there was one thing they must remember, and that was that the education at a board school

was in many respects superior to that at many grammar schools, especially the commercial side of education. He thought the decreased number of veterinary students was due to the fact that the remuneration in after life was not what it ought to be, considering the great expense of qualifying for the profession. It was all very well for Mr. Fraser to dwell upon the higher aims of life, but sentiment would not feed a family. (Hear, hear.) He was bound to confess that he practised for the sake of making a living, and he believed ninety-nine out of every hundred did the same. He wished to thank Professor M'Fadyean for coming forward with a paper that afternoon, as he had spared him the trouble of doing so. He (the speaker) would be able to save his paper for another occasion. (App.)

Mr. WRAGG said he was unfortunately obliged to leave the Council Chamber the other day before this question came on, and so he had not heard the subject thoroughly debated. He had gathered his knowledge from the published reports of the proceedings, like the majority of gentlemen present that afternoon. He quite agreed with Professor M'Fadyean in one thing, and that was that the raising of the standard of education at the present moment, and without proper notice, would be a great injustice to the students. There might be several young men who contemplated entering the profession, and who had prepared themselves with a College of Preceptors second class certificate; and that being so, it would be grossly unfair to suddenly say that only a first class certificate would be accepted. The profession was certainly not overcrowded now, whatever it was a few years ago, and they would be opposing the spirit of their Charter if they failed to supply the public with a sufficient number of veterinary surgeons. Mr Fraser argued that any ordinary boy of 13 could pass the examination at present, and instanced his own son, but that was really no argument, because it was only to be expected that any son of Mr. Fraser would have ability enough to do so. (Laughter). He himself thought sufficient time should elapse for the public to become thoroughly acquainted with the present standard of education. In another respect he agreed with Mr. Fraser, namely, that the veterinary profession did not want men who entered it for the sole purpose of making money. They wanted men who were inspired by a love of animals and a desire to enter a scientific profession. (App.)

Mr. MERRICK thought they were very much indebted to Professor M'Fadyean for introducing such a very interesting subject. He was only sorry he could not enter fully into the merits of it. He could only say that if a young man had to devote four years at college, and incur heavy expense, he might as well go in for medicine or the law, which would involve no more cost or trouble, but which would certainly bring him in a much more substantial income. He remembered the time when the blacksmith and the stud groom practised as a veterinary surgeon, and it was, of course, the right thing to make a man qualify for the profession by a proper system of education. At the same time he believed they could make the standard too high. (Hear, hear.)

Mr. GIBBINGS said he could not understand the remarks of Professor Dewar. It seemed inconsistent on the latter's part to recognise one examination on the ground that it was easier, and at the same time propose another that was difficult—to be prepared to accept the examination of the College of Preceptors and yet anxious to father a little college of his own—the Edinburgh Institute, he (the speaker) presumed. He thought it was perfectly ridiculous to expect the Royal College of Veterinary Surgeons to be bound down absolutely by such examinations as the General Medical Council might decide upon. It would, moreover, be very unwise. (Hear, hear). He hoped all veterinary surgeons had in view that higher aim of which Mr. Fraser spoke, yet the first consideration with most of them was the making of money.

Mr. WRAGG: My objection is that a veterinary surgeon should not be solely bent on making money.

Mr. GIBBINGS: Quite right; but I am afraid the higher aim is too often lost sight of.

Professor M'FADYEAN: We have stomachs to be filled. (Laughter.)

Mr. GIBBINGS, continuing, said he did not think the present educational standard was at all high, but he did not see why it ought to be made more stringent. The subject of examination included French, German, Latin, Euclid, Algebra, etc., and a fair knowledge of those subjects was all that any ordinary man required. He maintained that a man's social position was just what he liked to make it. (Hear, hear)

Mr. SPENCER, while agreeing that the thanks of the meeting were due to Professor M'Fadyean for his interesting paper, thought they ought also to thank Mr. Fraser, for the very lucid manner in which he had opened the discussion. He (the speaker) thought the main point was as to whether a higher standard of education was necessary. Personally speaking, he was afraid that if they made the standard too high, they would bring men into the profession who would jib at doing much of the work which the ordinary practitioner was called upon to perform. In his opinion, a higher standard of education was not necessary. Let it remain where it was, and instead of raising it let them insist on students serving a period of apprenticeship. (Hear, hear.) He was aware that in hazarding such an opinion, he was treading on tender ground, and that the managers of the veterinary schools might resent it. Nevertheless, he believed that the student who had served a pupilage with a qualified practitioner did better at College than one who had not. (Applause).

The PRESIDENT, in closing the discussion, said he wished specially to thank Professor M'Fadyean for having entertained them so spendidly that afternoon. He was inclined to agree with the statement that the first aim of a veterinary surgeon was to live. As a rule, he was not descended from monied families, generally otherwise. He thought that the thing most needed in the interests of the students, was a compulsory pupilage. With regard to the educational standard, he thought it was quite high enough, although he should not like to see it lowered. He was quite convinced, if they raised the standard any higher, unqualified men would once more gain ground. There was another point that had occurred to him, and that was whether it would not be wise to defer granting the diploma until the candidate was 22. Supposing a lad left school at 16, he could serve 2 years pupilage, and then his four years at the College would bring him up to 22, which was quite young enough for anyone to set up in practice.

Professor M'FADYEAN then replied to the discussion. He congratulated himself upon having introduced a subject in which the members of this Association evinced a lively interest. He did not expect that there would be unanimity of opinion on the part of those present. It was in the natural order of things that they should not all see matters in the same way, and he should have been quite content to let the subject remain exactly where it was, that is, he had given his views and others had signified theirs. But there were one or two things that had cropped up in the discussion which they would naturally expect him to reply to. He had listened with great interest to the very able speech made by Mr. Fraser. The latter began by declaring that if he was a sinner with regard to the action which he and eight other members of the Council took last month he was an unrepentant one. He would like to give Mr. Fraser a chance of taking that back, because he found it very hard to believe that he was so absolutely conscience-

less as that would seem to imply. He noticed particularly that although during the reading of the paper Mr. Fraser was very ready to interrupt (he was not complaining in any way) when he pointed out the enormity of the crime which those nine gentlemen were anxious to perpetrate, yet Mr. Fraser never referred to the subject when he got up to speak. Still, he took it that Mr. Fraser felt no repentance whatever, although he deliberately voted for a motion which would have broken what he (the speaker) declared to be a tacit bargain that the Royal College of Veterinary Surgeons had made with the students.

Mr. FRASER: Suppose we agreed to raise the standard, it would not follow that we must put it into immediate operation.

Professor M'FADYEAN: I can't allow that, because before the vote was taken the point was raised and the solicitor was asked to give his opinion. His opinion was that if we passed that motion, it would be bound to affect the students who had entered the College.

Mr. FRASER: I did not desire to inflict any hardship or injustice upon anyone. It was certainly my desire that sufficient notice should be given of any contemplated change.

Prof. M'FADYEAN: The Solicitor said that the motion would bind us to act without notice.

Mr. FRASER: Did he say so?

Prof. M'FADYEAN: Yes, and you can see it for yourself now.

Proceeding, Professor M'Fadyean said that voting for Professor Dewar's motion not only involved the raising of the standard, but also involved the College binding itself down to whatever alterations the General Medical Council might choose to make. That was an important point which Mr. Fraser did not defend. He (the speaker) would admit that it was a debatable question whether it was necessary or expedient to adopt a higher standard of education than at present; but it really was not debatable whether they should be bound down to observe any alterations that another Society altogether might choose to make.

Mr. FRASER: I can quite agree with you there.

Professor M'FADYEAN was delighted to have obtained an expression of opinion from Mr. Fraser which would compel that gentleman to vote against the motion when it came up again. (Laughter.) He really had on more than one occasion been amused by finding out how many members of the profession had sons who were so clever as to almost deserve the name of prodigies. It appeared to be a favourite argument among many who thought the standard too low at present, to say that because their own little boy at home, aged anywhere between 10 and 14 years, was able to pass the matriculation examination of the London University, everyone else ought to be able to do the same. He humbly submitted that that was no argument at all. He did not know how many sons of that phenomenal ability Mr Fraser or a few other members of the profession might have, but he was perfectly satisfied that they were not numerous enough to adequately recruit the profession. It was no use telling them about a few clever boys who could pass this examination, because the fact remained that a great majority of the boys, who of their own liking wanted to enter the profession, could not pass a higher examination.

Mr. FRASER: I know you don't want to do me an injustice. My boy is not particularly clever; I never said he was; yet he actually passed this examination.

Professor M'FADYEAN: You do your boy an injustice, because he is clever far beyond what you suppose him to be. (Laughter.) His (the speaker's) opportunities of judging were somewhat greater than Mr. Fraser's, and if the latter cited the case of his son as an indication of what the average boy of 14 or 15 could do, he declined to accept it. (Hear, hear). As a counter argument, he would point out that of the boys who entered their names as intending students at the Royal Veterinary College, never more than 30 per cent. were able to pass the existing standard. He would be very pleased to give the exact figures to anyone who cared to apply to him for them. The rejections the last time he added them up were 78 per cent., in other words there was only 22 per cent. of passes. When anyone asked him to ignore those figures, and to believe that in spite of them there would be more students come and pass if the standard were raised, he could only wonder whether the individual had been born on this planet. While listening to some of the visionary things to which Mr. Fraser had given utterance, he was tempted to think he was in one of the London theatres listening to "A Message from Mars." (Laughter.) Fancy anyone saying at a meeting of veterinary surgeons that a man ought not to get his diploma for the purpose of making money! What on earth was it for, then? Surely there was nothing degrading in any man attempting to make his living! Unless the veterinary profession was to be recruited from the sons of millionaires, the first object of the practitioner must be to make money. Mr. Fraser emphatically refused to believe that the extraordinary reduction in the number of students entering college, which began the very year that the standard of educational examination was raised, was in any way due to the increased difficulties of the examination. Mr. Fraser said it was entirely due to the present prosperous condition of trade and commerce. Being diametrically opposed to that view he (the speaker) could carry the point no further by argument, beyond stating that the reduction alluded to was foretold when the standard was last raised. He objected to Mr. Fraser's estimate of the cost to intending students which the raising of the standard would involve. If at present they could only pass 22 per cent. of their students, they would not pass more than five per cent. if a higher examination were required, and the extra cost to parents would be far more than £25. It would practically compel a boy to remain another year at school. That was very undesirable and closely connected with the question of pupilage. He did not think it was possible to insist upon pupilage at the present time, with a four years' curriculum and a higher standard of education. It would be a good thing if they could get their students young, and if they could be induced to spend a year or so with a veterinary surgeon, either before going to college or during an interval between some of the examinations. But to make it compulsory certainly seemed inadvisable. There was one other statement of Mr. Fraser's to which he must take exception. Mr. Fraser said he voted for a motion which would raise the standard of education in England. If Mr. Fraser maintained that that was an accurate description of the motion he (the speaker) unhesitatingly affirmed that it was not. As he had stated in his paper, it was an absolutely false statement to say that there was at present any inequality in the standards of the examinations in any of the three kingdoms. With regard to the point raised by Mr. Gibbins as to Professor Dewar's apparent inconsistency, he (the speaker) might state that Professor Dewar first brought the subject up in 1898, when he represented that the Scottish schools were labouring under an injustice. Prof. Dewar tried to get the Council to believe (or, at least, that was the interpretation put upon his remarks at the time) that the examinations had been very materially raised in Scotland, that was to say, above the level of any remaining examinations that Scotch students could sit for; and at that time Professor Dewar had an assurance from the College of Preceptors that they would conduct an examination in Scotland, which he declared was a lower examination. Mr. Spencer wanted to know whether it was necessary that the standard of examination should be raised at all. That was right enough, but he (the speaker) thought the real question was, "Is it

practicable to raise the standard?" After all, the main duty of the Council was to provide the public with a sufficient number of qualified veterinary surgeons, and if the standard of examination were materially raised, then the Council would be unable to guarantee an adequate supply of qualified men. Such a result would inevitably open the door to the unqualified practitioner, whom the Council had all along been endeavouring to exclude. In short it amounted to this: *Theoretically* it might truthfully be said that the standard of education for veterinary surgeons could not be too high; but *practically* it was possible to make the standard too high. And, as he had already said, if they raised the standard so very high that a sufficient number of men to meet the requirements of stockowners were not allowed to enter the profession, the only result would be that there would be a revival of quackery. (Applause.)

VOTE OF THANKS AND CONCLUSION.

Mr. GOOCH proposed a hearty vote of thanks to Professor M'Fadyean for his paper, which was seconded by Mr. Gibbings, and carried unanimously.

Professor M'FADYEAN, in reply, said he was not deserving of too many thanks. He had not been invited to read the paper, but volunteered to do so, as he thought it was such a good opportunity of ventilating an important subject. He was really indebted to the Association for allowing him to come and giving him such a patient hearing.

On the motion of Mr. Wragg, seconded by the Hon. Sec., a vote of thanks was also accorded to the President for his services in the chair.

The company then adjourned to another room for tea, after which they gradually dispersed.

H. J. DAWES, F.R.C.V.S., *Hon. Sec.*

EXTRACTS AND NOTES.

MAJOR ROSS ON MALARIA.

At a meeting of the Society of Arts, held on Wednesday, November 28th, at its house in John Street, Adelphi, with Professor Ray Lankester in the chair, Major Ronald Ross read a paper on "Malaria and Mosquitoes." In the first portion of his paper Major Ross gave a vivid picture of the symptoms and effects of malarial fever and after a reference to the older theories, such as assigned a telluric miasm as its cause, went on to explain how mosquitoes of the genus *Anopheles* had been deductively and experimentally proved to be the agents by which the disease was communicated. He concluded with some remarks on the subject of prevention. Since he last spoke on the question 18 months ago he said much additional information had been gathered regarding the habits of *Anopheles*, and the time was, he thought, now ripe for some movement against malaria. Acts of prevention might be private or public. It was not necessary to discuss the former; the prophylactic use of quinine, the employment of mosquito nets and window screens, and the destruction of larvæ round the house could and should be attended to by every one in malarious places. But public or municipal measures demanded examination because there were several rival methods in the field, each requiring a certain expenditure of time and money, and because before this expenditure was incurred inquiry should be made as to the method likely to give the best results at least cost.

Koch thought the mosquitoes should be left alone and that the parasites in man should be attacked by means of quinine. But, considering that a large percentage of children and many adults were always infected in malarious places, that meant a serious and expensive undertaking. It might be practicable in civilised countries where the people were intelligent enough to appreciate such efforts, and the attempt that was to be made to eradicate malaria by this means from the whole of Italy might possibly succeed. The method would also be useful in military and naval practice, and with gangs of coolies under European control; it might even succeed under strong German forms of government in German colonies, but was impossible under the weaker British rule. It would be amusing to see an attempt made to cinchonise a city of 30,000 natives—for example, Sierra Leone; it would require a military expedition to force them and their children to take repeated doses of quinine for many months. In India Government was not strong enough to compel segregation even against plague, and was not likely to be strong enough to force quinine down the throats of people who disbelieved in European remedies. Even if the measure were legally possible, it would be enormously expensive, as an army of doctors and tons of quinine would be required.

Another method was to guard Europeans by mosquito-proof houses. This would be most inadequate as a public measure, and would leave the mass of the population, including poor whites, traders, sailors, and others, quite unprotected. Window screens of galvanised iron wire rusted very quickly, and the screens of copper and brass wire, which would probably be found necessary, were expensive. Moreover, screened houses were likely to be hot and uncomfortable in tropical countries.

On the whole, Major Ross adhered to the method proposed by him to the Indian Government two years ago—that of careful surface drainage. To this he added removal of undergrowth, the use of culicides in certain cases, and, if possible, segregation and large, airy houses for Europeans. He had never thought, and never said, it would be possible to exterminate mosquitoes throughout Africa, for instance. He had always referred expressly to large towns, and he still thought that by careful treatment in this manner of the whole area of a malarial city, and by employing agents to destroy larvæ, the mosquitoes could, at least, be greatly reduced in numbers. Malaria had often been actually expelled by surface drainage, and what had been done before could be done again. This method would be cheapest and most effective in the end, and he did not think it would be so difficult as was sometimes anticipated. Of course, outside the towns screens and nets only could, as a rule, be resorted to.

It must be remembered that mosquitoes had been convicted of carrying elephantiasis, and perhaps yellow fever, as well as malaria. He regretted that, though it was now two years since the mosquito theory was established, no steps seem yet to have been taken by our Governments to prevent this disease in accordance with this new discovery. The period of probation had now in his opinion been completed, and the time for action had arrived. Nothing, he thought, would stimulate public action so much as the authoritative support of our principal men of science, who he wished would exert their influence.

Professor RAY LANKESTER, in opening the discussion, said that the merit of Major Ross in this matter was very great. With regard to preventive measures, it was an important point that malaria (otherwise ague) had only disappeared from this country within the last 40 years. Sir S. Wilks had told him that at the building of the Crystal Palace at Sydenham there was an epidemic of malaria, owing, presumably, to the pools formed during the digging operations. But this malaria had gone, not by destruction of mosquitoes, which were still abundant enough, but owing to the use of quinine, by which the parasite was killed in the human being, and the mosquito could get no fresh supply. The suggestion was

obvious that the disappearance of malaria should be effected in the same way in other countries. Of course the gnats should be got rid of as much as possible, but he himself, when he remembered how freely they bred, did not feel so sanguine of destroying them as was Major Ross.—*The Times.*

THE PHYSIOLOGY OF GASTRIC DIGESTION

(Extract from an Address delivered to the Ulster Medical Society).

By W. H. Thompson, M.D., F.R.C.S. Eng., etc.,

Dunville Professor of Physiology, Queen's Coll., Belfast

Physiology was formerly said to be the basis of rational medicine. It is a saying which has grown somewhat worn and old, but I fear the amount of conviction which it carries to the breast of the average medical man has not increased with its age. These are sentiments which perhaps I ought not to re-echo, but no real harm is ever done by fairly looking at facts in the face. All the less likely is this to happen in the present instance, because I believe the saying is in reality more true to-day than when it was first uttered. The intimate connection has only been obscured by other developments; the dissociation is more apparent than real.

Association not Sufficiently Intimate: Probable Causes.

In seeking to trace the origin of this feeling to its cause it seems to me that first and foremost should be placed the great and rapid development of the subject of physiology which carries its devotees far into fields where none but the specialist can be expected to follow them. This minute research is necessary if truths of moment are to be wrung from the secrets of nature. Nevertheless it is a process with which the man of practice cannot always sympathise. It is only when those truths are brought back, and take their place in the guidance of treatment that his interest is specially awakened.

Another circumstance to which I would assign a place in obscuring the link of connection between pure physiology and practical medicine is connected with the study and treatment of acute infectious disorders. These in themselves, always of great interest to the medical man, have been rendered doubly so by the great achievements of the science of bacteriology. The diagnosis of such maladies by the discovery of the micro-organisms which give origin to them, and the study of the life-history of these germs themselves have filled a gap that could not have been filled by any other means. In this way the science of germs has come to occupy an engrossing position in men's minds, and to a similar extent has overshadowed, and in a sense crowded out the older subject of physiology. But even here, where most obscured, the knowledge yielded by the latter must come in when the process of diagnosis is complete, and the curative treatment, if it is to be rational, is undertaken.

I should, however, be very sorry to convey to your minds that I do not fully appreciate the great good which has been done by the study of bacteriology. I only wish to recall your attention to the fact that there is still a solid substratum of physiological basis to the healing art, whose culture it is unwise to neglect if we are, as I hope it is the aim of all of us, to build up a stable, well-proportioned, and durable scientific structure.

Recent Advances in Physiology of Gastric Digestion.

Somewhat more than ten years ago an elaborate institute for the experimental study of medicine was established in St. Petersburgh. This institute consists of numerous departments, it is in short the Pasteur Institute of the capital of Russia. Two of these are devoted to the prosecution of physiological research—one in the field of chemical, the other more strictly in the field of experimental physiology. The director of the former is the distinguished Professor Nencki, of the latter the no less celebrated Professor J. P. Pawlow. It is to some of the work which has emanated from Pawlow's laboratory that I wish more especially to draw your attention. During the whole of the ten or more years which have elapsed since its foundation the laboratory, consisting of the director with a staff of assistants and numerous workers, has devoted itself exclusively to a systematic study of the processes of digestion. The first results of this combined work were given out in collected form, about three years ago, as a series of lectures to Russian physicians, and soon after published in the Russian language. The book was translated into German by Dr. Walther, one of the assistants of the laboratory, about a year later, and thus was made more available to the scientific world generally. It is quite a small work, less than 200 pages, but it literally teems with results of the most valuable kind to the practitioner of medicine. The volume was supplemented a few weeks ago by a further fasciculus of fewer than 50 pages.

From the chapters of the first of these publications, which deal with the subject of gastric digestion, I purpose to draw a few facts, which will serve to exemplify the nature of the work accomplished in Pawlow's laboratory. You can then judge of their practical bearing upon the science of medicine.

[We omit a few paragraphs here in which the author describes an improved method of forming not only a gastric fistula but also a gastric pouch from which pure gastric secretion can be taken at any time.—Ed. *V.R.*]

Some of the Results.

The first interesting fact confirmed by this method was that no secretion whatever occurs when the animal is fasting, but that a copious flow of juice can be set up by the mere act of chewing and swallowing food. This flow commences after a latent period of about five minutes has elapsed, never less than four and a half minutes, and is not due to the entry of food into the larger stomach. The latter was proved in an ingenious way—namely, by making an opening into the œsophagus in the neck, dividing the tube, and causing both ends to heal to the edges of the surface wound. After recovery the animal could be made to chew and swallow food as before, but the food came out at the opening in the neck, and unless specially led into the lower segment of the œsophagus did not enter the stomach.

It was then seen that this "make-believe feeding" caused precisely the same secretion of gastric juice, and that the flow could be kept up as long as the animal continued to chew and swallow. Another modification of the method consisted in making the œsophagotomy as described, together with an ordinary fistula leading into the stomach. The juice excited by "make-believe feeding" could thus be collected from the whole organ, and not alone from a shut-off segment.

Queries which Pawlow set out to Answer.

Having secured an admirable means of studying the work of the gastric glands, Pawlow set out to answer the following amongst numerous other interesting questions relative to their functional activity:—

1. Is the amount of juice secreted by the stomach in any way proportioned to the quantity of food eaten?

2. What is the way in which the juice is poured out? Is all or most of it discharged in one gush at the beginning of digestion, as soon as the meal is partaken of, or on the contrary by degrees, and in declining quantities

suitable to the gradual digestion and removal of dissolved food from the organ?

3. Does the digestive power of the juice—the amount of pepsin which it contains—vary in any way with the different phases of digestion, or is it constant throughout?

4. Has the nature of the food any influence on the quality of the juice; or are the gastric glands in any way able to adapt themselves to the kind of food presented them for digestion?

The answers to these questions, with some of the evidence, I shall endeavour to present to you seriatim, and in as few words as possible.

Relation between Amount of Food and Quantity of Juice.

Taking the first question as to whether there is any quantitative relation between the juice secreted and the amount of food partaken of; the facts on which the answer is based are shown you in the following table:—

Table I.—*Relation between the Quantity of Gastric Juice secreted and the Amount of Food taken*

Flesh diet	100 grams	= 26 c.cm.	Juice.
	200 „	= 40 „	
	400 „	= 106 „	
Mixed diet	300 c.cm. of milk, 50 grams flesh, 50 grams bread	= 42 „	„
„	Double above quantities	= 83·2 „	„

The figures are taken from experiments in which a dog was "make-believe" fed with varying quantities, in the first instance, of a flesh diet, and in the second of a mixed one, the juice being collected from the whole stomach. On looking at these you will see that the chewing of 100 grams flesh caused a flow of 26 c.cm. of juice, of 400 grams almost exactly four times that amount. Again a given quantity of mixed diet produced a secretion of 42 c.cm., double that amount gave rise to almost precisely double the quantity of juice. The gastric glands therefore work in health with the greatest precision, apportioning their labour with beautiful exactness to the magnitude of the task before them. Increase the unit mass of any food by a given multiple, and within ordinary limits, the glands will respond with a like increase of gastric juice.

Manner of Secretion of Gastric Juice.

Next comes the answer to the question relating to the manner in which the secretion of juice is spread out over the whole period of digestion.

The reply is taken from figures yielded by two experiments in which a dog was twice fed with 100 grams of flesh each time, the amount of juice poured out by the stomach pouch being measured hour by hour.

Table II.—*Hourly Rate of Secretion of Gastric Juice (Two Experiments: Dog Fed with 100 grams Flesh in each).*

	Experiment 1.	Experiment 2
Hour 1	11.2 c.cm.	12.6 c cm.
„ 2	8.2 „	8.0 „
„ 3	4.0 „	2.2 „
„ 4	1.9 „	1.1 „
„ 5	0.1 „	1 drop
Total	25.4 „	23.9 „

Here you will see that the greatest secretion occurs during the early periods of digestion, but that the juice continues to be discharged in declining quantity as long as any food remains to be dealt with. The glands, therefore, do not pour out all their fluid at once and leave matters to themselves, but "stand by," paying out more and more with strict economy as long as the needs of the case demand, and the same result repeats itself with stereotyped exactness, as often as the same conditions are fulfilled. The course, therefore, which gastric secretion runs, follows definite and purposive laws, and is by no means a matter of blind chance.

Digestive Power varies with Stage of Digestion.

And now comes the reply to the third query. If the glands are thus capable of varying their rate of secretion in so remarkable a manner, according to the needs of digestion, are they not likewise able to extend similar variations to the digestive power—the pepsin content—of the juice which they secrete? I speak only of pepsin content because Pawlow has shown that the acidity of the juice, as it pours from the glands, is always constant, and varies only because it comes into contact with more or less of an alkaline mucus, which latter in health should not be present.

The digestive power of the juice was determined by causing it to act on short columns of coagulated egg-white, contained in capillary glass tubes broken into small pieces. The length of column dissolved gives a reliable means of measuring the activity of the juice. The results obtained from two experiments on a dog fed each time with 400 grams of flesh are given below:

Table III.—*Digestive Power of Gastric Juice (Quantity of Pepsin at Different Stages of Digestion) (Two Experiments; Dog fed with 400 grams of Flesh).*

	Experiment 1.	Experiment 2.
Hour 1	6.0 mm.	5.8 mm.
„ 2	4.5 „	4.1 „
„ 3	3.4 „	3.4 „
„ 4	3.5 „	3.0 „
„ 5	3.8 „	3.8 „
„ 6	3 0 „	3.1 „
„ 7	3.6 „	3.5 „
„ 8	3.9 „	4.5 „

You will see from these figures that the juice secreted at the beginning of the meal has, in the case before us, the greatest digestive power—that is, contains the most pepsin—when presumably it is most required, and that the proportion gradually declines as the need for it likewise decreases during the following stages. The glands then have also the power of varying the quantity of pepsin which they discharge in the juice according to the same laws by which they vary the total amount of secretion poured out.

So far then we find ourselves dealing with a mechanism whose adaptation to its work could not be more perfect nor more beautifully conceived.

Regulation of the Juice to the Nature of the Food.

But the fourth question is perhaps the most interesting of the whole in the series which I have selected. Has the nature of the food any influence on the quality or quantity of the juice? Are the glands capable of adapting their secretion to the kind of food presenting them for digestion, and if so, how is this met?

The answer to the first part of the question is undoubtedly in the affirmative, the variations applying not only to the quality and quantity of the fluid, but likewise in the course and duration of its outflow. It would occupy too much time to quote all the experiments on which the facts are based, but these are the chief facts themselves.

Weight for weight the greatest amount of juice is poured out on flesh diet, the least on milk, bread being intermediate.

The total acidity is greatest with a flesh and lowest with a bread diet.

The digestive power—the pepsin content—is greatest with the juice poured out on bread, least on milk, the

proportion being as follows: Bread-formed juice, 44; flesh-formed, 16; and milk-formed, 11. Milk, therefore, in agreement with what is known from everyday experience, makes least demands on the activity of the glands for its digestion.

Nor do the peculiarities end here. The manner in which the juice is secreted and the period at which it attains its maximum digestive power are likewise different for each class of food-stuff. This is exemplified in the following table:

TABLE IV.—*Influence of the Kind of Food on the Quantity and Quality of the Gastric Juice.*

	Quantity of Juice in c.cm.			Digestive Power in mm. of egg white.		
	Flesh.	Bread.	Milk.	Flesh.	Bread.	Milk.
Hour 1	11.22	10.6	4.0	4.95	6.10	4.21
„ 2	11.30	5.4	8.6	3.03	7.97	2.35
„ 3	7.60	4.0	9.2	3.01	7.51	2.35
„ 4	5.10	3.4	7.7	2.87	6.19	2.65
„ 5	2.80	3.3	4.0	3.20	5.29	4.63
„ 6	2.20	2.2	0.5	3.58	5.72	6.12
„ 7	1.20	2.6	—	2.25	5.48	—
„ 8	0.60	2·2	—	3.87	5.50	—

Quantities of Food—Flesh, 200 grams; Bread 200 grams; Milk, 600 c.cm.

The time of maximum flow occurs therefore with a flesh diet either in the first or second hour, and both are nearly equal, with a bread diet in the first, and with a milk diet in the second hour. The period of maximum strength is reached in the first hour with flesh, in the second or third with bread, and towards the end of digestion with milk diet.

Fixed Modifications of the Digestive Fluids to suit Particular Diets.

Intimately connected with the foregoing is a further important question, namely, whether the digestive system is capable of permanently adopting itself to a special form of diet or not. Thus, given a continued preponderance, say of proteid in the diet, with a paucity of fat and carbohydrate, or on the other hand, a more than usual proportion of carbohydrate, with a scarcity of fat or proteid, or lastly an undue amount of fat; what power have the digestive organs of meeting these possibilities? The answer is that a condition is gradually established whereby a steady increase takes place in the amount of special ferment which is necessary to meet the requirements of the particular diet, while at the same time a decrease in those which are superfluous sets in. Such adaptation is, however, not accomplished through the gastric glands but by means of the pancreas. The main importance of the matter lies in the fact that once having established a dietic adaptation of secretion, it cannot be undone in a day. Great alterations in a dietary, therefore, even when urgently demanded, can only be advantageously introduced by degrees.

Flow of Juice from "Make-Believe Feeding."

And now one point more, before I leave the results which I have selected from this admirable series of researches. It is I think perhaps the neatest determination made in the whole set of experiments. This is no other than an actual estimation of the value of the combined act of chewing and swallowing in terms of gastric juice.

In establishing the fixed rate of secretion, for the whole act of digesting a particular meal (which as a matter of fact under like conditions has been found to be always the same) we have determined the value of chewing and swallowing, *plus* the further exciting effect of the food after it enters the stomach. But we can estimate the value of these two factors separately, that of chewing and swallowing in the way I have explained to you, by receiving the food from an opening in the œsophagus and not allowing it to enter the stomach. The other factor is known if we bring the same meal directly into the main stomach of the animal through an ordinary gastric fistula, and observe its effects on the secretion as shown by the stomach pouch. Food introduced in this manner is not nearly so powerful an excitant of juice flow as when it enters in the usual way. But the curious fact comes out that the sum total of the "make-believe-feeding" or swallowing juice, *plus* that caused by the mere introduction of food is exactly equal to that of the whole meal swallowed and digested in the ordinary way. Thus by having any two of the foregoing factors, we can readily determine the third, and in this way we learn that the whole of the earlier part of the secretion is an accompaniment of the act of chewing and swallowing, and not at all dependent on the mere entry of food into the stomach.

Now this "make-believe" juice, if we may so call it for shortness, is not only copious in amount, but of a very active character. It constitutes therefore a most important part of the whole. But although an accompaniment and apparently caused by these combined events, it is not really so.

Value of Appetite in causing Secretion.

The same secretion can be excited by the mere sight of food, accompanied by an eager desire on the part of a hungry animal to have it. This implies that the food is such as will excite this keen desire, and without it the chewing and swallowing are wholly ineffective. Everything, therefore, which aids in creating the desire for food and in augmenting the satisfaction of having it has its material value in an increased flow of the best and most active gastric juice. Hence the importance of set preliminaries to the chief meal of the day. The customary ablutions, the change of raiment, the dismissal from the mind of business anxieties, the table decorations, the plan of the meal, the savoury odours, and, last but not least, the expectation of finding an appetising repast, these are all matters of moment and have their fixed values in terms of active gastric juice.

I may now return to the query with which I left off—regarding the application of physiological methods to the study of disease.

It would be ungracious of me to find fault in any way with the excellent clinical work done in this country, even if I possessed the authority or had the wish to do so That is not my purpose. I wish rather to indicate a line of work which might, I think, be more cultivated, and which I believe has great possibilities connected with it. It is work which will necessitate a considerable expenditure of time and trouble, but these considerations must not stand as serious obstacles in one's path when the end in view is important. The line of work to which I refer consists in the fuller application of the methods of chemical physiology to clinical work.—*The British Medical Journal.*

According to a provincial paper (says *The Globe*) Lord Salisbury was walking out from the Foreign Office with Mr. Balfour the other day, when a gentleman passing at the moment saluted the Leader of the House of Commons. "Who is that pleasant-looking man?" asked the Prime Minister. "That," said Mr. Balfour, "is the Minister of Agriculture, Mr. Walter Long."

PROFESSOR CALMETTE ON THE PLAGUE.

At the Examination Hall of the Royal College of Physicians and Surgeons, Victoria Embankment, on Wednesday, Professor A. Calmette, director of the Pasteur Institute at Lille, gave the first of the Harben lectures for this year, the subject being the plague. After enumerating the places at which there had been outbreaks of the disease since August, 1896, Dr. Calmette gave a short account of the symptoms presented by those attacked, pointing out that from the clinical point of view there were two main forms—bubonic plague and plague without buboes. Patients suffering from the former, which was much the more common, resembled subjects struck with serious adynamic typhoid fever. Of non-bubonic plague there were several varieties—*e.g.* primitive pneumonic, in which the symptoms resembled ordinary pneumonia, the septicæmic, and the exhausted non-malignant type, which had been described by other writers by the name of "Pestis mitior," as frequent at the beginning and end of great epidemics. The diagnosis of plague could only be exactly determined when bacteriological examination demonstrated the presence of the microbe of Yersin. A culture should be made with a few drops of fluid withdrawn from the lymphatic tissues of the patient, and the indications gained therefrom might be rendered more precise by inoculating susceptible animals with the culture. In a suspected case of the pneumonic type advantage might be taken of the fact that of the organisms normally present in the saliva, the pneumococci did not germinate at all, and the streptococci slowly and badly at 20° to 23°C.—a temperature at which the plague bacilli readily developed. Mice, rats, and guinea-pigs showed the greatest susceptibility to plague. It had long been remarked that in localities where the plague raged mice and rats died in great numbers, and from the most ancient times, and even to-day, the Chinese and the nomadic people inhabiting the northern slopes of the Himalayas, so soon as they noticed the abundance of dead rats, removed elsewhere to avoid the epidemic they knew must be at hand. Of other animals the pig and ox had been said to be subject to the plague, but it was not true that they could take the disease, at least spontaneously. Nor did birds easily contract it; the vultures that devoured the corpses of the plague-stricken in the Towers of Silence in the suburbs of Bombay suffered no ill after their funereal repast, although it was not proved that they did not scatter plague microbes far and wide through their excreta. A monkey contracted the plague spontaneously when placed in a cage side by side with another monkey; in this and similar cases the infection was manifestly carried by flies or by fleas and other parasites of the skin.

In the second lecture Professor Calmette discussed anti-plague serum therapy. In all cases, he said, the infection, whatever the mode of entry of the virus, resulted in the multiplication of the plague bacillus, first in the lymphatic channels and then in the blood. Even a few hours after infection the bacilli were to be found in the blood, and they existed in immense quantities in all the organs of the person attacked. The effect, therefore, of an injection of the serum should be to provoke their rapid destruction by phagocytosis and bacteriolysis. But this result was scarcely attained by the slow absorption of serum injected subcutaneously; the organism not being at once impregnated with the active substance, some of the bacilli escaped the phagocytic process, and, growing accustomed to the action of the serum, ended by resisting its influence entirely. Hence, after a time of inaction more or less long, the infection took its course and the serum was powerless to check it. This explanation of the non-success of the sero-therapic treatment was confirmed by clinical observations. But the results were different if the serum, instead of being merely introduced below the skin, was as soon as possible after the beginning of the disease injected straight into the veins. Four or five hours after such injection the temperature dropped, rising again for eight or twelve hours afterwards, and then dropping finally. This temporary rise corresponded to the period during which the bacilli were being removed from the circulation by the leucocytes. If the treatment had been speedy, cure was effected in two or three days. The serums of vaccinated animals contained two substances—one, alexin, which had the power of digesting the bacterial cell, and which existed in normal serums, and the other, the reagent, or intermediary substance, which existed only in very small quantities in normal serums. In unvaccinated animals, as the reacting substance did not exist in sufficient amount, the normal alexins in the blood were unable to dissolve the microbic bodies when serious infection took place. Hence, to overcome the infection, a sufficient quantity of the reacting substance must be supplied to the organism. Anti-plague serum was a reacting substance, and within its sphere of action when injected the leucocytes and alexins were enabled to dissolve the plague bacilli; though beyond it the bacilli escaping phagocytosis, gradually became immune. Hence, it was necessary that the reaction of the leucocytes and alexins should be carried on simultaneously throughout the organism, and as rapidly as possible, and hence the reason why the serum must be injected into the general circulation. A very small quantity of the serum was sufficient to react on an enormous quantity of alexins. It might therefore be laid down that a doctor confronted with a case of plague must immediately inject 20 c.c. of the serum into a superficial vein of the patient, to be followed after 24 hours by another similar injection if the fever had not subsided completely, and if the diagnosis of plague was confirmed. No one need fear to perform such intravenous injections; they were absolutely harmless if care was taken to inject gently and not to introduce into the blood either air bubbles or antiseptic particles. Anti-plague serum constituted the best known method for curing the plague, and was equally useful as a prophylactic, though unfortunately its preventive action only lasted eight or ten days, and therefore the injections must be repeated every week. At Oporto and at Glasgow the important fact had been established that persons preventively inoculated who afterwards, within the immune period, contracted the disease felt only very slight symptoms, and always got well. The preventive injection, which should be made under the skin of the abdomen in a dose of 10 c.c., occasionally caused cutaneous eruptions and sometimes pains in the joints, but these symptoms were transitory, and not very serious. Above all, the serum had the immense advantage of conferring immunity in a few hours. *The Times.*

The Prussian Army Veterinary Report for 1899.

The Militär-Wochenotatt publishes a summary of the Prussian Army Veterinary Report for 1899. The number of horses in the army during the first three-quarters of the year was 77,125, and during the fourth quarter 80,720. The cases of sickness were 26,580, or 3,277 less than the previous year. The treatment was successful in 24,119 cases; 293 horses were discharged as unfit for service, 987 died, and 288 were killed, making a total loss of 1568 horses, or five more than in the previous year, 893 horses were still under treatment at the end of the year. Glanders has nearly disappeared from among the army horses, there being only 13 attacks of it and one death from it during the year. Infectious chest disease or murrain showed itself in 2,301 cases—a few more than in 1896, but 964 less than in 1898. Of the

2301 cases, 1973 were cured, 82 died, and 204 remained under treatment. Most of the cases, 1,044, occurred during the last quarter of the year. The exact length of the incubation period of disease is still unsettled, but it is probably longer than has been hitherto believed. In one case a period of 31 days was observed. Fresh air and isolation of cases are the preventive measures taken. Inoculation has so far proved unsuccessful. Intestinal murrain or dysentary attacked 861 horses only, against 2066 in 1898 and 1481 in 1897. Only two horses died from it. More than half the cases occurred in the third quarter of the year. The number of cases of colic and the number of deaths from it were slightly below the average. They were respectively 3082 and 450. There were only 107 cases of inflammation of the chest and lungs, but 57 of these resulted in death.—*The Times.*

ARMY VETERINARY DEPARTMENT.

Quaggalaagte, Nov. 27.—Lieut. G. Conder, slightly wounded—leg.

Information has been received that Vet. Surg. Moore met with a serious accident whilst riding at Standerton.

Lt.-Col. Rayment, A.V.D., arrived at Plymouth on Nov. 30th, invalided home.

Capt. J. Moore, A.V.D., and Vet.-Lieut. H. C. Jagger, I.Y., arrived at Southampton in the "Assaye" on Dec. 4 from South Africa, invalided home.

C.V.S. J. Stanley-Clarke, D. G. Moberley, E. E. Clode, S. Hurst, W. P. Hill, and W. C. Waring arrived at Plymouth on Dec. 4th in the "Fort Salisbury" from South Africa.

CORRESPONDENCE

UNQUALIFIED PRACTITIONERS.—A REAL GRIEVANCE.

Sir,

Your correspondent, Dr. Poole, does not appear to understand the position of Colonial graduates of veterinary medicine: they have no *locus standi* in the ranks of the profession in this country unless they hold a registrable diploma "recognised for the time being by the Council of the R.C.V.S. as furnishing a sufficient guarantee of the possession of the requisite knowledge, etc., etc." So says the Act, and as yet the Royal College has not recognised any Colonial diplomas; but it is open to all possessing them to apply for registration, and far be it from us to put any obstacles in their way if only their qualifications come up to the standard required.

As to the *cost* of a Colonial or foreign diploma, it is well known that it is considerably less in time and money than that of the mother country; it is therefore obvious that if the *quality* were inferior it would be a "real grievance" to put it on an equality with our own.

Let Dr. Poole's Colonial friends by all means come over and test their eligibility for Her Majesty's service.—Yours truly,

HENRY DYER.

Croydon, Dec. 4.

"SETTING" ROARERS.

Sir,

Under a new heading for which your correspondent, James MacArthur, M.R.C.V.S., must please take the responsibility, I am asked to do something which I have previously explained I am not at liberty to do, viz., comment upon evidence given in a case which is still *sub-judice*. May I respectfully suggest, sir, that you would have been justified under the circumstances in politely requesting this correspondent to reconstruct his letter. Surely, what binds one binds all! I only appeal for uniform "correctness," and if I may so remark without offending our friend, *lucidity*. For instance, he asks me a *question*, viz., "If I used the words *inexperienced people*," or any words to that effect? And immediately he proceeds to answer it himself (assumedly) in the *negative*!! for he says "If not, I think he made a very serious charge against his professional brethren in leading the public to believe it impossible for *veterinary surgeons to detect broken-wind and roaring in horses that have been drugged and manipulated.*

Leaving the *charge* for the moment, sir, it is interesting to note that our friend obviously means that the whole profession, including himself, are able to detect *broken-wind* and *roaring* in horses which have been *drugged and manipulated*. He is actually indignant at the idea that the public should think otherwise! And yet, sir, in the next paragraph he asks me if I will "impart a little *knowledge* on this subject to him James Macarthur, *M.R.C.V.S.*)—*re* this effectual though temporary *cure* for *roaring*."

Please note that the word *cure* is, like the imaginary *charge*, entirely the creation of your correspondent. I never said anything about *curing!* And as regards the absurd charge, I may remark in passing that the only opinion I have ever expressed is that it is only *inexperienced people* generally, mere "novices" who are thus deceived, and I have always carefully pointed out (at the risk of offending the Registration Committee *re advertising* the whole profession) that the only safeguard is to insist upon having a veterinary surgeon's examination as, of course, he would not fail to detect anything wrong with a horse's wind. Consequently our friend's imaginary *charge* may be dispelled as mere "wind" and, like myself, you and your readers will doubtless ever retain a kindly remembrance of his "quixotic championship" on the one hand, and his somewhat nervous anxiety on the other to have some knowledge imparted on what he says "has always appeared *to him* as one of the *mysteries* of horse coping."—Yours sincerely,

EDWARD G. JOHNSON.

53 Norfolk Street, Sheffield.
5th December.

NO CASE.

Sir,

It is characteristic that after three opportunities for putting himself right, Mr. Dollar should now pretend that he does not understand the issue.

He says that I insinuated he "was trying to obtain credit under false pretences." Not at all. I accepted his statement that he had not verbally claimed credit, but I pointed out that, in spite of his efforts, he had got it, and I suggested that he should disabuse the minds of the readers of *Harmsworth's Magazine* that he was (as therein asserted) the inventor of the "Travail Bascule."

I offer no complaint of the tone of Mr. Dollar's letter. It is only his misfortune that he cannot express himself without exhibiting all the classic signs of inflammation—heat, pain and swelling. I assure him I asked my original question in all good faith, and if Mr. Dollar desires to reply in the same spirit I feel sure the profession would like to know just what are the substantial improvements in Vinsot's machine that he claims to have made.—Yours truly,

HENRY GRAY.

Lower Phillimore Place, W.

COMMUNICATIONS, BOOKS, AND PAPERS RECEIVED:—Messrs. H. Dyer, R. W. Clarke.

Report on Investigation in Inoculation against Rinderpest, Imp. Bact. Lab., Muktesar, India, by Leonard Rogers, M.D., M.R.C.P., B.S., F.R.C.S. *Slaughtering and Inspection Act, 1900*, (New Zealand).